CDS 2 2024

LIVE

MATHS

REVISION

CLASS 11

NAVJYOTI SIR

SSBCrack EXAMS

21 August 2024 Live Classes Schedule

8:00AM	21 AUGUST 2024 DAILY CURRENT AFFAIRS	RUBY MA'AM
9:00AM	21 AUGUST 2024 DAILY DEFENCE UPDATES	DIVYANSHU SIR

NDA 2 2024 LIVE CLASSES

11:00AM	GK - ECONOMICS REVISION - CLASS 2	RUBY MA'AM
1:00PM	MATHS REVISION - CLASS 11	NAVJYOTI SIR
2:00PM	CHEMISTRY REVISION - CLASS 4	SHIVANGI MA'AM

CDS 2 2024 LIVE CLASSES

11:00AM	GK - ECONOMICS REVISION - CLASS 2	RUBY MA'AM
2:00PM	CHEMISTRY REVISION - CLASS 4	SHIVANGI MA'AM
3:00PM	MATHS REVISION - CLASS 11	NAVJYOTI SIR

REVISION TOPICS :

- Algebra
- Trigonometry

Q) If $x^3 + y^3 + z^3 = 3(1 + xyz)$, $P = y + z - x$, $Q = z + x - y$ and $R = x + y - z$, then what is the value of $P^3 + Q^3 + R^3 - 3PQR$?

(a) 9 (b) 8 (c) 12 (d) 6

$x^3 + y^3 + z^3 = 3(1 + xyz)$

$y = 0$; $z = 0$

$x^3 + 0 + 0 = 3(1 + 0)$

$x^3 = 3$

$P = -x$

$Q = x$

$R = x$

$P^3 + Q^3 + R^3 - 3PQR$

$-x^3 + x^3 + x^3 - 3(-x)(x)(x)$

$x^3 + 3x^3 = 4x^3$

$= 4(3) = 12$

Q) If $x^3 + y^3 + z^3 = 3(1 + xyz)$, $P = y + z - x$, $Q = z + x - y$ and $R = x + y - z$, then what is the value of $P^3 + Q^3 + R^3 - 3PQR$?

(a) 9 (b) 8 (c) 12 (d) 6

Ans: (c)

Q) The value of k for which

$$x + 2y + 7 = 0$$
$$2x + ky + 14 = 0$$

and represent coincident lines is

(a) 3 (b) 4

(c) –4 (d) –3

$a_1x + b_1y + c_1 = 0$

$a_2x + b_2y + c_2 = 0$

$\left(\frac{a_1}{a_2} = \frac{b_1}{b_2}\right) = \frac{c_1}{c_2}$ (for coincident lines)

$\frac{1}{2} = \frac{2}{k} \Rightarrow \underline{k = 4}$

Q) The value of k for which

$$x + 2y + 7 = 0$$

$$2x + ky + 14 = 0$$

and represent coincident lines is

(a) 3 (b) 4

(c) –4 (d) –3

Ans: (b)

Q) Tanya's grandfather was 8 times older to her 16 years ago. He would be 3 times of her age after 8 years from now. Eight years ago, what was the ratio of Tanya's age to that of her grandfather?

(a) 1 : 2 (b) 1 : 5

(c) 3 : 8 (d) None of these

16 years ago — x

8 years ago — $x+8$

Now — $x+16$

8 years — $x+16+8$

$8x$

$8x+8$

$8x+16$

$8x+16+8$

$3(x+24) = 8x+24$

$5x = 48 \Rightarrow x = \frac{48}{5}$

$$\frac{x+8}{8x+8} = \frac{\frac{48}{5}+8}{8\left(\frac{48}{5}+1\right)}$$

$= \frac{88}{8(53)} = \frac{11}{53} = 11:53$

Q) Tanya's grandfather was 8 times older to her 16 years ago. He would be 3 times of her age after 8 years from now. Eight years ago, what was the ratio of Tanya's age to that of her grandfather?

(a) 1 : 2
(b) 1 : 5
(c) 3 : 8
(d) None of these

Ans: (d)

Q) If $x + \frac{1}{x} = \sqrt{3}$, then the value of $x^{18} + x^{12} + x^6 + 1$ is

(a) 0 (b) 1 (c) 2 (d) 3

$\left(x + \frac{1}{x}\right)^3 = 3\sqrt{3}$

$x^3 + \frac{1}{x^3} + 3\left(x + \frac{1}{x}\right) = 3\sqrt{3}$

$x^3 + \frac{1}{x^3} = 3\sqrt{3} - 3\sqrt{3}$

$x^3 + \frac{1}{x^3} = 0$

$x^{12}(x^6 + 1) + 1(x^6 + 1)$

$(x^{12} + 1)(x^6 + 1)$

$(x^{12} + 1)\, x^3 \left(x^3 + \frac{1}{x^3}\right)$

$= 0$

Q) If $x + \frac{1}{x} = \sqrt{3}$, then the value of $x^{18} + x^{12} + x^6 + 1$ is

(a) 0 (b) 1 (c) 2 (d) 3

Ans: (a)

Q) If $x^2+y^2+z^2 = xy+yx+zx$, then the value of

$$\frac{3x^4+7y^4+5z^4}{5x^2y^2+7y^2z^2+3z^2x^2}$$ is

(a) 1 (b) 2 (c) -1 (d) 0

$x^2+y^2+z^2 = xy+yx+zx \Rightarrow (x-y)^2+(y-z)^2+(z-x)^2 = 0$

$\Rightarrow x=y=z$

$x-y=0 \mid y-z=0 \mid z-x=0$

$$\frac{3x^4+7x^4+5x^4}{5x^4+7x^4+3x^4} = \frac{3+7+5}{5+7+3} = 1$$

Q) If $x^2+y^2+z^2=xy+yx+zx$, then the value of

$$\frac{3x^4+7y^4+5z^4}{5x^2y^2+7y^2z^2+3z^2x^2}$$ is

(a) 1 (b) 2 (c) –1 (d) 0

Ans: (a)

Q) If $x^2 + y^2 + 2x + 1 = 0$, then the value of $x^{31} + y^{35}$ is

(a) -1 (b) 0 (c) 1 (d) 2

$(x+1)^2 + y^2 = 0$

$\Rightarrow (x+1) = 0 \Rightarrow x = -1$

$\Rightarrow y = 0$

$(-1)^{31} + (0)^{35}$

$= -1$

Q) If $x^2 + y^2 + 2x + 1 = 0$, then the value of $x^{31} + y^{35}$ is

(a) -1 (b) 0 (c) 1 (d) 2

Ans: (a)

Q) If $x^4 + \frac{1}{x^4} = 119$ amd $x > 1$, then the value of $x^3 - \frac{1}{x^3}$ is

(a) 54 (b) 18 (c) 72 (d) 36

$\left(x^2 + \frac{1}{x^2}\right)^2 - 2 = 119$

$x^2 + \frac{1}{x^2} = 11$

$\left(x - \frac{1}{x}\right)^2 + 2 = 11$

$x - \frac{1}{x} = 3$

$\left(x - \frac{1}{x}\right)^3 - 3\left(x - \frac{1}{x}\right)$

$= (3)^3 - 3(3)$

$= 27 - 9$

$= 18$

Q) If $x^4 + \frac{1}{x^4} = 119$ amd $x > 1$, then the value of $x^3 - \frac{1}{x^3}$ is

(a) 54 (b) 18 (c) 72 (d) 36

Ans: (b)

Q) If $x-\frac{1}{x}=\frac{1}{3}$, then what is $9x^2+\frac{9}{x^2}$ is equal to?

(a) 18
(b) 19
(c) 20
(d) 21

$$9\left(x^2+\frac{1}{x^2}\right) = 9\left[\left(x-\frac{1}{x}\right)^2+2\right]$$

$$= 9\left[\left(\frac{1}{3}\right)^2+2\right] = 9\left[\frac{1}{9}+2\right] = 1+18$$

$$= 19$$

Q) If $x-\frac{1}{x}=\frac{1}{3}$, then what is $9x^2+\frac{9}{x^2}$ is equal to?

(a) 18
(b) 19
(c) 20
(d) 21

Ans: (b)

Q) If $p = 999$, then the value of $\sqrt[3]{p(p^2+3p+3)+1}$ is

(a) 1000 (b) 999 (c) 998 (d) 1002

Q) If $p = 999$, then the value of $\sqrt[3]{p(p^2+3p+3)+1}$ is

(a) 1000 (b) 999 (c) 998 (d) 1002

Ans: (a)

Q) If $2\sqrt{2}x^3 - 3\sqrt{3}y^3 = (\sqrt{2}x - \sqrt{3}y)(Ax^2 + By^2 + Cxy)$, then the value of $A^2 + B^2 - C^2$ is:

(a) 11 (b) 7 (c) 19 (d) 10

Q) If $2\sqrt{2}x^3 - 3\sqrt{3}y^3 = (\sqrt{2}x - \sqrt{3}y)(Ax^2 + By^2 + Cxy)$, then the value of $A^2 + B^2 - C^2$ is:

(a) 11 (b) 7 (c) 19 (d) 10

Ans: (b)

Q) If the roots of the equation $(a^2 + b^2)x^2 - 2(ac + bd)x + (c^2 + d^2) = 0$ are equal, then which of the following is true?

(a) $ab = cd$ (b) $ad = bc$

(c) $ad = \sqrt{bc}$ (d) $ab = \sqrt{cd}$

Q) If the roots of the equation $(a^2 + b^2)x^2 - 2(ac + bd)x + (c^2 + d^2) = 0$ are equal, then which of the following is true?

(a) $ab = cd$ (b) $ad = bc$

(c) $ad = \sqrt{bc}$ (d) $ab = \sqrt{cd}$

Ans: (b)

Q) What is the value of

$$\frac{725\times725\times725+371\times371\times371}{725\times725-725\times371+371\times371}\ ?$$

(a) 9610
(b) 1960
(c) 1096
(d) 1016

Q) What is the value of

$$\frac{725\times725\times725+371\times371\times371}{725\times725-725\times371+371\times371}\ ?$$

(a) 9610 (b) 1960

(c) 1096 (d) 1016

Ans: (c)

Q) If the sum of a real number and its reciprocal is $\frac{26}{5}$, then how many such numbers are possible?

(*a*) None (*b*) One (*c*) Two (*d*) Four

Q) If the sum of a real number and its reciprocal is $\frac{26}{5}$, then how many such numbers are possible?

(*a*) None (*b*) One (*c*) Two (*d*) Four

Ans: (d)

Q) My brother is 3 years elder to me. My father was 28 years of age when my sister was born while my mother was 26 years of age when I was born. If my sister was 4 years of age when my brother was born, then, what was the age of my father and mother respectively when my brother was born?

(a) 32 yrs, 23 yrs
(b) 32 yrs, 29 yrs
(c) 35 yrs, 29 yrs
(d) 35 yrs, 33 yrs

Q) My brother is 3 years elder to me. My father was 28 years of age when my sister was born while my mother was 26 years of age when I was born. If my sister was 4 years of age when my brother was born, then, what was the age of my father and mother respectively when my brother was born?

(a) 32 yrs, 23 yrs
(b) 32 yrs, 29 yrs
(c) 35 yrs, 29 yrs
(d) 35 yrs, 33 yrs

Ans: (a)

Q) Consider the following statements :

1 The equation $1990x - 173y = 11$ has no solution in integers for x and y.

2. The equation $3x - 12y = 7$ has no solution in integers for x and y.

Which of the above statements is/are correct?

(a) 1 only (b) 2 only

(c) Both 1 and 2 (d) Neither 1 nor 2

Q) Consider the following statements :

1 The equation $1990x - 173y = 11$ has no solution in integers for x and y.

2. The equation $3x - 12y = 7$ has no solution in integers for x and y.

Which of the above statements is/are correct?

(a) 1 only (b) 2 only

(c) Both 1 and 2 (d) Neither 1 nor 2

Ans: (c)

Q) Ten chairs and six tables together cost ₹ 6200, three chairs and two tables together cost ₹ 1900. The cost of 4 chairs and 5 tables is

(a) ₹ 3000
(b) ₹ 3300
(c) ₹ 3500
(d) ₹ 3800

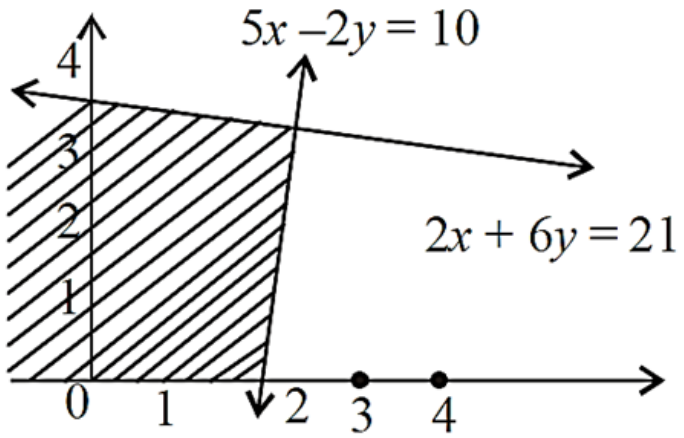
Q) Ten chairs and six tables together cost ₹ 6200, three chairs and two tables together cost ₹ 1900. The cost of 4 chairs and 5 tables is

(a) ₹ 3000 (b) ₹ 3300

(c) ₹ 3500 (d) ₹ 3800

Ans: (a)

Q)



The linear inequations, for which the shaded area in the figure given above is the solution set, are

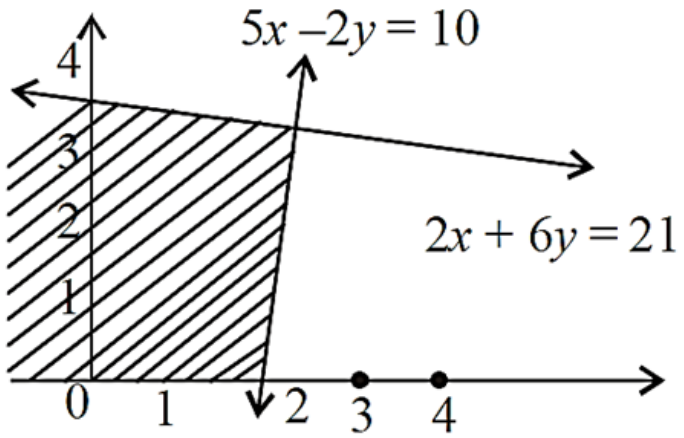
(a) $2x+6y \leq 21, 5x-2y \leq 10$

(b) $2x+6y \leq 21, 5x-2y \geq 10$

(c) $2x+6y \geq 21, 5x-2y \leq 10$

(d) $2x+6y \geq 21, 5x-2y \geq 10$

Q)



The linear inequations, for which the shaded area in the figure given above is the solution set, are

(a) $2x+6y \leq 21, 5x-2y \leq 10$

(b) $2x+6y \leq 21, 5x-2y \geq 10$

(c) $2x+6y \geq 21, 5x-2y \leq 10$

(d) $2x+6y \geq 21, 5x-2y \geq 10$

Ans: (a)

Q) There are three brothers. The sums of ages of two of them at a time are 4 years, 6 years and 8 years. The age difference between the eldest and the youngest is

(a) 3 years
(b) 4 years
(c) 5 years
(d) 6 years

Q) There are three brothers. The sums of ages of two of them at a time are 4 years, 6 years and 8 years. The age difference between the eldest and the youngest is

(a) 3 years (b) 4 years

(c) 5 years (d) 6 years

Ans: (b)

Q) If $x+y+z=11, x^2+y^2+z^2=133$ and $x^3+y^3+z^3=881$, then the value of $\sqrt[3]{xyz}$ is:

(a) -6 (b) 6 (c) -8 (d) 8

$$\{x^3+y^3+z^3-3xyz=(x+y+z)(x^2+y^2+z^2-xy-yz-zx)\}$$

$$(x+y+z)^2=x^2+y^2+z^2+2(xy+yz+zx)$$

$$(11)^2=133+2(xy+yz+zx)$$

$$-6=xy+yz+zx$$

$$-(xy+yz+zx)=6$$

$$881-3xyz=(11)(133+6)$$

$$xyz=\frac{881-1529}{3}$$

$$xyz=\frac{-648}{3}=-216 \Rightarrow \sqrt[3]{xyz}=-6$$

Q) If $x+y+z=11, x^2+y^2+z^2=133$ and $x^3+y^3+z^3=881$, then the value of $\sqrt[3]{xyz}$ is:

(a) -6 (b) 6 (c) -8 (d) 8

Ans: (a)

SSBCrack EXAMS

Q) If α and β are the roots of the equation $x^2 - 6x + 6 = 0$, what is $\alpha^3 + \beta^3 + \alpha^2 + \beta^2 + \alpha + \beta$ equal to?

$\alpha + \beta = 6$

$\alpha\beta = 6$

(a) 150 (b) 138

(c) 138 (d) 124

$$\left[(\alpha+\beta)^3 - 3(\alpha+\beta)\alpha\beta\right] + \left[(\alpha+\beta)^2 - 2\alpha\beta\right] + (\alpha+\beta)$$

$$\left[6^3 - 3\times6\times6 + \left((6)^2 - 2\times6\right)\right] + 6$$

$$= 216 - 108 + 36 - 12 + 6$$

$$=$$

Q) If α and β are the roots of the equation $x^2 - 6x + 6 = 0$, what is $\alpha^3 + \beta^3 + \alpha^2 + \beta^2 + \alpha + \beta$ equal to?

(a) 150
(b) 138
(c) 138
(d) 124

Ans: (b)

Q) If $x_1x_2x_3 = 4(4 + x_1 + x_2 + x_3)$, then what is the value of $[1/(2 + x_1)] + [1/(2 + x_2)] + [1/(2 + x_3)]$?

(a) 1 (b) 1/2 (c) 2 (d) 1/3

$x_1 x_2 x_3 = 4(4 + x_1 + x_2 + x_3)$

$x_1 = x_2 = x_3 = 4$

$\frac{1}{2+4} + \frac{1}{2+4} + \frac{1}{2+4} = 3 \times \frac{1}{6} = \frac{1}{2}$

Q) If $x_1x_2x_3 = 4(4 + x_1 + x_2 + x_3)$, then what is the value of $[1/(2 + x_1)] + [1/(2 + x_2)] + [1/(2 + x_3)]$?

(a) 1 (b) 1/2 (c) 2 (d) 1/3

Ans: (b)

Q) If $P = 7 + 4\sqrt{3}$ and $PQ = 1$, then what is the value of $1/P^2 + 1/Q^2$?

(a) 196 (b) 194 (c) 206 (d) 182

$Q = \frac{1}{P} = \frac{1}{7+4\sqrt{3}} = 7 - 4\sqrt{3}$

$(7-4\sqrt{3})^2 + (7+4\sqrt{3})^2$

$2(7^2 + (4\sqrt{3})^2)$

$= 2(49 + 48) = 200 - 6 = \underline{194}$

Q) If $P = 7 + 4\sqrt{3}$ and $PQ = 1$, then what is the value of $1/P^2 + 1/Q^2$?

(a) 196 (b) 194 (c) 206 (d) 182

Ans: (b)

Q) If α and β are the roots of equation $x^2 - x + 1 = 0$, then which equation will have roots α^3 and β^3?

(a) $x^2 + 2x + 1 = 0$

(b) $x^2 - 2x - 1 = 0$

(c) $x^2 + 3x - 1 = 0$

(d) $x^2 - 3x + 1 = 0$

Q) If α and β are the roots of equation $x^2 - x + 1 = 0$, then which equation will have roots α^3 and β^3?

(a) $x^2 + 2x + 1 = 0$
(b) $x^2 - 2x - 1 = 0$
(c) $x^2 + 3x - 1 = 0$
(d) $x^2 - 3x + 1 = 0$

Ans: (a)

Q) If $(a+b):(b+c):(c+a)=7:6:5$ and $a+b+c=27$, then what will be the value of $\frac{1}{a}:\frac{1}{b}:\frac{1}{c}$?

(a) $3:6:4$ (b) $3:2:4$ (c) $4:3:6$ (d) $3:4:2$

Q) If $(a+b):(b+c):(c+a)=7:6:5$ and $a+b+c=27$, then what will be the value of $\frac{1}{a}:\frac{1}{b}:\frac{1}{c}$?

(a) $3:6:4$ (b) $3:2:4$ (c) $4:3:6$ (d) $3:4:2$

Ans: (c)

Q) If $x + y + z = 0$, then what is the value of $(3y^2 + x^2 + z^2)/(2y^2 - xz)$?

(a) 2 (b) 1 (c) 3/2 (d) 5/3

Q) If $x + y + z = 0$, then what is the value of $(3y^2 + x^2 + z^2)/(2y^2 - xz)$?

(a) 2 (b) 1 (c) 3/2 (d) 5/3

Ans: (a)

Q) If $a^2 + b^2 + c^2 + 96 = 8(a + b - 2c)$, then $\sqrt{ab - bc + ca}$ is equal to:

(a) 6 (b) $2\sqrt{2}$ (c) 4 (d) $2\sqrt{3}$

Q) If $a^2 + b^2 + c^2 + 96 = 8(a + b - 2c)$, then $\sqrt{ab - bc + ca}$ is equal to:

(a) 6 (b) $2\sqrt{2}$ (c) 4 (d) $2\sqrt{3}$

Ans: (c)

Q) If $\sqrt{86-60\sqrt{2}} = a - b\sqrt{2}$, then what will be the value of $\sqrt{a^2+b^2}$, correct to one decimal place?

(a) 8.4 (b) 8.2 (c) 7.8 (d) 7.2

Q) If $\sqrt{86-60\sqrt{2}} = a - b\sqrt{2}$, then what will be the value of $\sqrt{a^2+b^2}$, correct to one decimal place?

(a) 8.4 (b) 8.2 (c) 7.8 (d) 7.2

Ans: (c)

Q) If $x = 11$, the value of $x^5 - 12x^4 + 12x^3 - 12x^2 + 12x - 1$ is

(a) 11 (b) 10 (c) 12 (d) -10

Q) If $x = 11$, the value of $x^5 - 12x^4 + 12x^3 - 12x^2 + 12x - 1$ is

(a) 11 (b) 10 (c) 12 (d) -10

Ans: (b)

Q) If $a+\frac{1}{b}=b+\frac{1}{c}=c+\frac{1}{a}$ (where $a \neq b \neq c$), then abc is equal to

(a) $+1$
(b) -1
(c) $+1$ & -1
(d) None of the options

Q) If $a+\frac{1}{b}=b+\frac{1}{c}=c+\frac{1}{a}$ (where $a \neq b \neq c$), then abc is equal to

(a) $+1$
(b) -1
(c) $+1$ & -1
(d) None of the options

Ans: (c)

Q) If $x-\sqrt{3}-\sqrt{2}=0$ and $y-\sqrt{3}+\sqrt{2}=0$ then value of $(x^3-20\sqrt{2})-(y^3+2\sqrt{2})$

(a) 3 (b) 2 (c) 0 (d) 1

Q) If $x-\sqrt{3}-\sqrt{2}=0$ and $y-\sqrt{3}+\sqrt{2}=0$ then value of $(x^3-20\sqrt{2})-(y^3+2\sqrt{2})$

(a) 3 (b) 2 (c) 0 (d) 1

Ans: (c)

Q) If $a+b+c+d=4$ then the value of

$$\frac{1}{(1-a)(1-b)(1-c)}+\frac{1}{(1-b)(1-c)(1-d)}$$

$$+\frac{1}{(1-c)(1-d)(1-a)}+\frac{1}{(1-d)(1-a)(1-b)} \text{ is.}$$

(a) 0 (b) 1 (c) 4 (d) $1+abcd$

Q) If $a+b+c+d=4$ then the value of

$$\frac{1}{(1-a)(1-b)(1-c)}+\frac{1}{(1-b)(1-c)(1-d)}$$

$$+\frac{1}{(1-c)(1-d)(1-a)}+\frac{1}{(1-d)(1-a)(1-b)}$$ is.

(a) 0 (b) 1 (c) 4 (d) $1+abcd$

Ans: (a)

Q) If $(x^3 - y^3) : (x^2 + xy + y^2) = 5 : 1$ and

$(x^2 - y^2) : (x - y) = 7 : 1$, then the ratio $2x : 3y$ equals

(a) $2 : 3$ (b) $4 : 1$ (c) $4 : 3$ (d) $3 : 2$

Q) If $(x^3 - y^3) : (x^2 + xy + y^2) = 5 : 1$ and

$(x^2 - y^2) : (x - y) = 7 : 1$, then the ratio $2x : 3y$ equals

(a) $2 : 3$ (b) $4 : 1$ (c) $4 : 3$ (d) $3 : 2$

Ans: (b)

Q) What fraction is that whose numerator being doubled and denominator increased by 7, the value becomes $\frac{2}{3}$, but when the denominator being doubled, and the numerator increased by 2, the value becomes $\frac{3}{5}$?

(a) 3/5 (b) 4/5 (c) 5/7 (d) 7/11

Q) What fraction is that whose numerator being doubled and denominator increased by 7, the value becomes $\frac{2}{3}$, but when the denominator being doubled, and the numerator increased by 2, the value becomes $\frac{3}{5}$?

(a) 3/5 (b) 4/5 (c) 5/7 (d) 7/11

Ans: (b)

Q) Farah got married 8 years ago. Today her age is $1\frac{2}{7}$ times her age at the time of her marriage. At present her daughter's age is one-sixth of her age. What was her daughter's age 3 years ago?

(a) 6 years
(b) 4 years
(c) 3 years
(d) None of these

Q) Farah got married 8 years ago. Today her age is $1\frac{2}{7}$ times her age at the time of her marriage. At present her daughter's age is one-sixth of her age. What was her daughter's age 3 years ago?

(a) 6 years
(b) 4 years
(c) 3 years
(d) None of these

Ans: (c)

Q) If x, y, z are the three factors of $a^3 - 7a - 6$, then value of $x + y + z$ will be

(a) 3a (b) 3 (c) 6 (d) a

Q) If x, y, z are the three factors of $a^3 - 7a - 6$, then value of $x + y + z$ will be

(a) 3a (b) 3 (c) 6 (d) a

Ans: (a)

Q) If $x = a^{1/2} + a^{-1/2}$, $y = a^{1/2} - a^{-1/2}$, then value of

$$(x^4 - x^2y^2 - 1) + (y^4 - x^2y^2 + 1)$$

(a) 16 (b) 14 (c) 12 (d) 13

Q) If $x = a^{1/2} + a^{-1/2}$, $y = a^{1/2} - a^{-1/2}$, then value of

$$(x^4 - x^2y^2 - 1) + (y^4 - x^2y^2 + 1)$$

(a) 16 (b) 14 (c) 12 (d) 13

Ans: (a)

Q) If $a + b = 1$, find the value of $a^3 + b^3 - ab - (a^2 - b^2)^2$

(a) 0 (b) 1 (c) –1 (d) 2

Q) If $a + b = 1$, find the value of $a^3 + b^3 - ab - (a^2 - b^2)^2$

(a) 0 (b) 1 (c) –1 (d) 2

Ans: (a)

Q) If $(3x-2y):(2x+3y)=5:6$, then one of value of $\left(\frac{\sqrt[3]{x}+\sqrt[3]{y}}{\sqrt[3]{x}-\sqrt[3]{y}}\right)^2$ is

(a) 25 (b) $\frac{1}{5}$ (c) $\frac{1}{25}$ (d) 5

Q) If $(3x-2y):(2x+3y)=5:6$, then one of value of $\left(\frac{\sqrt[3]{x}+\sqrt[3]{y}}{\sqrt[3]{x}-\sqrt[3]{y}}\right)^2$ is

(a) 25 (b) $\frac{1}{5}$ (c) $\frac{1}{25}$ (d) 5

Ans: (a)

Q) If $\tan\theta = \frac{2}{3}$, then $\frac{3\sin\theta - 4\cos\theta}{3\sin\theta + 4\cos\theta}$ is equal to:

(a) $-\frac{1}{3}$ (b) $\frac{2}{3}$ (c) $-\frac{2}{3}$ (d) $\frac{1}{3}$

$$\frac{3\frac{\sin\theta}{\cos\theta} - 4}{3\frac{\sin\theta}{\cos\theta} + 4} = \frac{3\tan\theta - 4}{3\tan\theta + 4} = \frac{2-4}{2+4} = \frac{-2}{6} = -\frac{1}{3}$$

Q) If $\tan\theta = \frac{2}{3}$, then $\frac{3\sin\theta - 4\cos\theta}{3\sin\theta + 4\cos\theta}$ is equal to:

(a) $-\frac{1}{3}$ (b) $\frac{2}{3}$ (c) $-\frac{2}{3}$ (d) $\frac{1}{3}$

Ans: (a)

Q) If $\sin\theta = \sqrt{3}\cos\theta$, $0° < \theta < 90°$, then the value of $2\sin^2\theta + \sec^2\theta + \sin\theta\sec\theta + \operatorname{cosec}\theta$ is:

(a) $\frac{33+10\sqrt{3}}{6}$ (b) $\frac{19+10\sqrt{3}}{6}$

(c) $\frac{33+10\sqrt{3}}{3}$ (d) $\frac{19+10\sqrt{3}}{3}$

$\sin\theta = \sqrt{3}\cos\theta$ | $\sin\theta = \sqrt{3}\sin(90°-\theta)$

$\theta = 60°$

$2\left(\frac{3}{4}\right) + 4 + \left(\frac{\sqrt{3}}{2}\right)(2) + \frac{2}{\sqrt{3}}$

$\frac{3}{2} + 4 + \sqrt{3} + \frac{2}{\sqrt{3}}$

$\frac{3\sqrt{3} + 8\sqrt{3} + 6 + 4}{2\sqrt{3}}$

$\frac{10 + 11\sqrt{3}}{2\sqrt{3}} = \frac{33+10\sqrt{3}}{6}$

Q) If $\sin\theta = \sqrt{3}\cos\theta$, $0° < \theta < 90°$, then the value of $2\sin^2\theta + \sec^2\theta + \sin\theta\sec\theta + \operatorname{cosec}\theta$ is:

(a) $\frac{33+10\sqrt{3}}{6}$

(b) $\frac{19+10\sqrt{3}}{6}$

(c) $\frac{33+10\sqrt{3}}{3}$

(d) $\frac{19+10\sqrt{3}}{3}$

Ans: (a)

Q) What is the value of

$$\frac{\left\{\begin{array}{l}\left[4\cos(90-A)\sin^3(90+A)\right]- \\ \left[4\sin(90+A)\cos^3(90-A)\right]\end{array}\right\}}{\cos\left(\frac{180+8A}{2}\right)}?$$

(a) 1 (b) −1 (c) 0 (d) 2

$$\frac{4\sin A\cos^3 A - 4\cos A\sin^3 A}{\cos(90+4A)} = \frac{4\sin A\cos A\left(\cos^2 A-\sin^2 A\right)}{-\sin 4A}$$

$$= \frac{2\sin 2A\cos 2A}{-2\sin 2A\cos 2A} = -1$$

Q) What is the value of

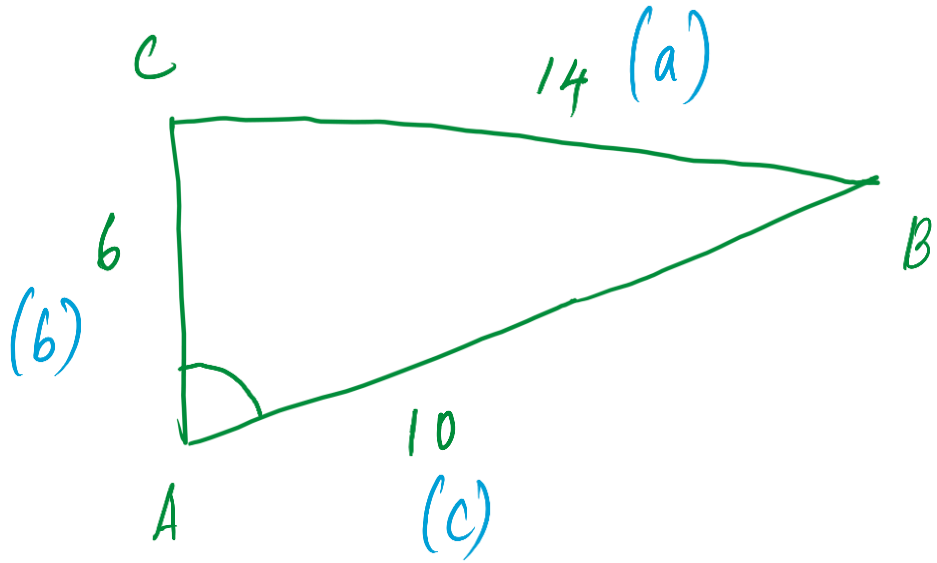
$$\frac{\left\{\begin{array}{l}\left[4\cos(90-A)\sin^3(90+A)\right]- \\ \left[4\sin(90+A)\cos^3(90-A)\right]\end{array}\right\}}{\cos\left(\frac{180+8A}{2}\right)}?$$

(a) 1 (b) -1 (c) 0 (d) 2

Ans: (b)

Q) If the sides of a triangle are 6cm, 10cm and 14 cm, then what is the largest angle included by the sides?

(a) 90°
(b) 120°
(c) 135°
(d) 150°



$$\cos A = \frac{b^2 + c^2 - a^2}{2bc}$$

$$\cos A = \frac{6^2 + 10^2 - 14^2}{2 \times 6 \times 10}$$

$$\cos A = -\frac{60}{120} = -\frac{1}{2}$$

$$A = 120^\circ$$

Q) If the sides of a triangle are 6cm, 10cm and 14 cm, then what is the largest angle included by the sides?

(a) 90°
(b) 120°
(c) 135°
(d) 150°

Ans: (b)

Q) If $(\sin x + \operatorname{cosec} x)^2 + (\cos x + \sec x)^2$

$= k + \tan^2 x + \cot^2 x,$

then what is the value of k?

(a) 8 (b) 7

(c) 4 (d) 3

$\sin^2 x + \operatorname{cosec}^2 x + 2 + \cos^2 x + \sec^2 x + 2$

$1 + \operatorname{cosec}^2 x + \sec^2 x + 4$

$5 + 1 + \cot^2 x + 1 + \tan^2 x$

$7 + \cot^2 x + \tan^2 x$

Q) If $(\sin x + \operatorname{cosec} x)^2 + (\cos x + \sec x)^2$

$$= k + \tan^2 x + \cot^2 x,$$

then what is the value of k?

(a) 8 (b) 7

(c) 4 (d) 3

Ans: (b)

Q) Let $0 < x < \frac{\pi}{4}$ then $(\sec 2x - \tan 2x)$ equals

(a) $\tan\left(x - \frac{\pi}{4}\right)$

(b) $\tan\left(\frac{\pi}{4} - x\right)$

(c) $\tan\left(x + \frac{\pi}{4}\right)$

(d) $\tan^2\left(x + \frac{\pi}{4}\right)$

$$\frac{1 - \sin 2x}{\cos 2x}$$

$$\frac{1 - \left(\frac{2\tan x}{1 + \tan^2 x}\right)}{\frac{1 - \tan^2 x}{1 + \tan^2 x}}$$

$$\frac{\tan x - 1}{1 + \tan x}$$

$$= \frac{(1 - \tan x)^2}{1 - \tan^2 x} = \frac{1 - \tan x}{1 + \tan x}$$

Q) Let $0 < x < \frac{\pi}{4}$ then $(\sec 2x - \tan 2x)$ equals

(a) $\tan\left(x - \frac{\pi}{4}\right)$

(b) $\tan\left(\frac{\pi}{4} - x\right)$

(c) $\tan\left(x + \frac{\pi}{4}\right)$

(d) $\tan^2\left(x + \frac{\pi}{4}\right)$

Ans: (b)

Q) If $\cos\theta + \sec\theta = k$, then what is the value of $\sin^2\theta - \tan^2\theta$?

(a) $4 - k$ (b) $4 - k^2$ (c) $k^2 - 4$ (d) $k^2 + 2$

(c) $1 - \sin^2\theta + 1 + \tan^2\theta + 2 - 4$

(d) $1 - \sin^2\theta + 1 + \tan^2\theta + 2 + 2$

(b) $4 - \cos^2\theta - \sec^2\theta - 2$

$2 - 1 + \sin^2\theta - 1 - \tan^2\theta$

$\sin^2\theta - \tan^2\theta$

Q) If $\cos\theta + \sec\theta = k$, then what is the value of $\sin^2\theta - \tan^2\theta$?

$(a)\ \ 4-k \qquad (b)\ \ 4-k^2 \qquad (c)\ \ k^2-4 \qquad (d)\ \ k^2+2$

Ans: (b)

Q) If $\sin\theta + \cos\theta = \sqrt{2}$, then what is $\sin^6\theta + \cos^6\theta + 6\sin^2\theta\cos^2\theta$ equal to?

(a) $\frac{1}{4}$ (b) $\frac{3}{4}$ (c) 1 (d) $\frac{7}{4}$

Q) If $\sin\theta + \cos\theta = \sqrt{2}$, then what is $\sin^6\theta + \cos^6\theta + 6\sin^2\theta\cos^2\theta$ equal to?

(a) $\frac{1}{4}$ (b) $\frac{3}{4}$ (c) 1 (d) $\frac{7}{4}$

Ans: (d)

Q) What is $\dfrac{\sin^6\theta - \cos^6\theta}{\sin^2\theta - \cos^2\theta}$ equal to?

(a) $\sin^4\theta - \cos^4\theta$

(b) $1 - \sin^2\theta\cos^2\theta$

(c) $1 + \sin^2\theta\cos^2\theta$

(d) $1 - 3\sin^2\theta\cos^2\theta$

Q) What is $\dfrac{\sin^6\theta - \cos^6\theta}{\sin^2\theta - \cos^2\theta}$ equal to?

(a) $\sin^4\theta - \cos^4\theta$

(b) $1 - \sin^2\theta\cos^2\theta$

(c) $1 + \sin^2\theta\cos^2\theta$

(d) $1 - 3\sin^2\theta\cos^2\theta$

Ans: (b)

Q) If $\sec\theta - \operatorname{cosec}\theta = \frac{4}{3}$, then what is $(\sin\theta - \cos\theta)$ equal to

(a) Only –2

(b) Only $\frac{1}{2}$

(c) Both –2 and $\frac{1}{2}$

(d) Neither $\frac{1}{2}$ nor –2

Q) If $\sec\theta - \operatorname{cosec}\theta = \frac{4}{3}$, then what is $(\sin\theta - \cos\theta)$ equal to

(a) Only –2

(b) Only $\frac{1}{2}$

(c) Both –2 and $\frac{1}{2}$

(d) Neither $\frac{1}{2}$ nor –2

Ans: (c)

Q) The value of $\cot(45° + \theta)\cot(45° - \theta)$ is

(a) -1 (b) 0 (c) 1 (d) ∞

Q) The value of $\cot(45° + \theta)\cot(45° - \theta)$ is

(a) -1 (b) 0 (c) 1 (d) ∞

Ans: (c)

Q) What is the value of $\frac{1-2\sin^2\theta\cos^2\theta}{\sin^4\theta+\cos^4\theta}+4$ equal to?

(a) 0 (b) 1 (c) 2 (d) 5

Q) What is the value of $\frac{1-2\sin^2\theta\cos^2\theta}{\sin^4\theta+\cos^4\theta}+4$ equal to?

(a) 0 (b) 1 (c) 2 (d) 5

Ans: (d)

Q) The value of $\dfrac{\cos^3 20^\circ - \cos^3 70^\circ}{\sin^3 70^\circ - \sin^3 20^\circ}$ is

(a) $\dfrac{1}{2}$ (b) $\dfrac{1}{\sqrt{2}}$ (c) 1 (d) 2

Q) The value of $\frac{\cos^3 20° - \cos^3 70°}{\sin^3 70° - \sin^3 20°}$ is

(a) $\frac{1}{2}$ (b) $\frac{1}{\sqrt{2}}$ (c) 1 (d) 2

Ans: (c)

Q) If the angles of a triangle are $30°$ and $45°$ and the included side is $\left(\sqrt{3}+1\right)$ cm, then what is the area of the triangle ?

(a) $\left(\sqrt{3}+1\right)$ cm^2

(b) $\left(\sqrt{3}+3\right)$ cm^2

(c) $\frac{1}{2}\left(\sqrt{3}+1\right)$ cm^2

(d) $2\left(\sqrt{3}+1\right)$ cm^2

Q) If the angles of a triangle are $30°$ and $45°$ and the included side is $\left(\sqrt{3}+1\right)$ cm, then what is the area of the triangle ?

(a) $\left(\sqrt{3}+1\right)$ cm^2 (b) $\left(\sqrt{3}+3\right)$ cm^2

(c) $\frac{1}{2}\left(\sqrt{3}+1\right)$ cm^2 (d) $2\left(\sqrt{3}+1\right)$ cm^2

Ans: (c)

Q) Consider the following :

1. $\frac{\cos A}{1-\tan A}+\frac{\sin A}{1-\cot A}=\cos A+\sin A$

2. $(1-\sin A-\cos A)^2 = 2(1-\sin A)(1+\cos A)$

Which of the above is/are identity/identities?

(a) 1 only (b) 2 only

(c) Both 1 and 2 (d) Neither 1 nor 2

Q) Consider the following :

1. $\frac{\cos A}{1-\tan A}+\frac{\sin A}{1-\cot A}=\cos A+\sin A$

2. $(1-\sin A-\cos A)^2 = 2(1-\sin A)(1+\cos A)$

Which of the above is/are identity/identities?

(a) 1 only (b) 2 only

(c) Both 1 and 2 (d) Neither 1 nor 2

Ans: (c)

Q) If α and β are positive angles such that $\alpha + \beta = \frac{\pi}{4}$, then what is $(1 + \tan\alpha)(1 + \tan\beta)$ equal to?

(a) 0 (b) 1

(c) 2 (d) 3

Q) If α and β are positive angles such that $\alpha + \beta = \frac{\pi}{4}$, then what is $(1 + \tan\alpha)(1 + \tan\beta)$ equal to?

(a) 0 (b) 1

(c) 2 (d) 3

Ans: (c)

Q) If $2\cos^2 x + 3\sin x - 3 = 0, 0 \leq x \leq 180°$ the value of x is

(a) $30°, 90°, 150°$ (b) $60°, 120°, 180°$

(c) $0°, 30°, 150°$ (d) $45°, 90°, 135°$

Q) If $2\cos^2 x + 3\sin x - 3 = 0, 0 \leq x \leq 180°$ the value of x is

(a) $30°, 90°, 150°$ (b) $60°, 120°, 180°$

(c) $0°, 30°, 150°$ (d) $45°, 90°, 135°$

Ans: (b)

Q) If $\operatorname{cosec}\theta - \sin\theta = p^3$ and $\sec\theta - \cos\theta = q^3$, then what is the value of $\tan\theta$?

(a) $\frac{p}{q}$ (b) $\frac{q}{p}$ (c) pq (d) p^2q^2

Q) If $\operatorname{cosec}\theta - \sin\theta = p^3$ and $\sec\theta - \cos\theta = q^3$, then what is the value of $\tan\theta$?

(a) $\frac{p}{q}$ (b) $\frac{q}{p}$ (c) pq (d) p^2q^2

Ans: (b)

Q) From an aeroplane flying about a river at an altitude of 1200 m, it is observed that the angles of depression of opposite points on the two banks of a river are 30° and θ. If the width of the river is 3000 m, then which one of the following is correct ?

(a) $\theta < 30°$ (b) $30° < \theta < 45°$

(c) $45° < \theta < 60°$ (d) $60° < \theta < 90°$

Q) From an aeroplane flying about a river at an altitude of 1200 m, it is observed that the angles of depression of opposite points on the two banks of a river are 30° and θ. If the width of the river is 3000 m, then which one of the following is correct ?

(a) $\theta < 30°$ (b) $30° < \theta < 45°$

(c) $45° < \theta < 60°$ (d) $60° < \theta < 90°$

Ans: (c)

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CLASS 12

NAVJYOTI SIR

SSBCrack EXAMS

REVISION TOPICS : (22/08/24)

- Trigonometry
- Geometry